

**UNITED STATES DEPARTMENT OF COMMERCE****Patent and Trademark Office**Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/236,933	05/02/94	HUFFMAN	D 7913ZAZY

IM52/0427

LEOPOLD PRESSER
SCULLY, SCOTT, MURPHY & PRESSER
400 GARDEN CITY PLAZA
GARDEN CITY NY 11530

EXAMINER
DI MAURO, P

ART UNIT
1754

33

DATE MAILED: 04/27/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	08/236933	Applicant(s)	Huffman
Examiner	Di Mauro	Group Art Unit	1754

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication .
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- Responsive to communication(s) filed on 1/11/99
 This action is FINAL.
 Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- Claim(s) 45-49,51-84, 9b,181,203-248 is/are pending in the application.
Of the above claim(s) _____ is/are withdrawn from consideration.
 Claim(s) _____ is/are allowed.
 Claim(s) 45-49,51-84, 9b,181,203-248 is/are rejected.
 Claim(s) _____ is/are objected to.
 Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
 The proposed drawing correction, filed on _____ is approved disapproved.
 The drawing(s) filed on _____ is/are objected to by the Examiner.
 The specification is objected to by the Examiner.
 The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
 All Some* None of the CERTIFIED copies of the priority documents have been received.
 received in Application No. (Series Code/Serial Number) _____.
 received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

Attachment(s)

- Information Disclosure Statement(s), PTO-1449, Paper No(s). _____ Interview Summary, PTO-413
 Notice of Reference(s) Cited, PTO-892 Notice of Informal Patent Application, PTO-152
 Notice of Draftsperson's Patent Drawing Review, PTO-948 Other _____

Office Action Summary

Art Unit: 1754

Claims 45-49, 51-84, 96, 181 and 203-248 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 45, 181 and 233-234 and those dependent therefrom, it is unclear how much constitutes amounts capable of being extracted in "solid" form. The extraction in solid form language appears to be a means-plus function limitation under 35 U.S.C. 112-6th paragraph. Since the specification fails to set forth the equivalents for this language, it fails to particularly point out and distinctly claim the invention as required under 35 U.S.C. 112-2nd paragraph: see, In re Dossel, 42 USPQ 2nd, 1881, at 1885.

It is also indefinite because, if, arguendo, a microgram of C₆₀ qualified as a solid, would a process which produced a kilogram of soot which in toto contained microgram C₆₀ (i.e., a parts-per-billion concentration) be within the claims (since 1 microgram C₆₀ is "capable" of being extracted and "capable" of yielding 1 microgram solid C₆₀?) does the claimed process depend upon scale it is run, i.e., how much "sooty carbon product" is made or collected, or whether the process is batch or continuous? The lower limit as to the scope of the claimed "amounts" is indefinite because it is unclear how much of anything is the accepted value to be considered a "solid". Note that a solid particle of colloidal gold can be 1.7×10^{-7} cm in size. Is this the order of magnitude which applicants intend?

In claim 83, lines 4-7 and in claim 84, lines 5-7, and in claim 222, it is unclear as to what is the scope of "amounts (or quantities) (of C₆₀) sufficient to be capable of producing a...colored

BEST AVAILABLE COPY

Art Unit: 1754

solution when extracted with sufficient (or effective) amounts of benzene". The extraction such that a colored solution is formed language appears to be a means-plus-function limitation under 35 U.S.C. 112-6th paragraph. Since the specification fails to set forth the equivalents for this language, it fails to particularly point out and distinctly claim the invention as required under 35 U.S.C. 112-2nd paragraph: see, In re Dossel, vide supra.

It is also indefinite for the following reasons: Would a metric ton of "sooty carbon product" containing a gram. of C₆₀ (i.e., a ppm C₆₀ concentration), and extracted with a liter of solvent, be within the scope of the claims (since quantities on the order of 1 gram C₆₀ can impart color to solvent quantities on the order of one liter)? What then is the lower limit of the scope of the claims as to amount of C₆₀?

In claims 234 and those dependent therefrom, it is unclear what is the scope of "discernible". What analytical means are implied to "discern" a solid? Note that an electron microscope can sometimes be used to "discern" small solids such as viruses. Is this the scope which applicants intend?

Claims 204, 213, 222 and 230 (and those dependent therefrom) require an extraction step to be conducted in such a manner such that crystalline C60 is formed. Claims 45 and 232 (and those dependent therefrom) require an extraction step to be conducted in such a manner that macroscopic C60 is formed. This extraction language appears to be a means-plus-function limitation under 35 U.S.C. 112-6th paragraph. Since the specification fails to set forth the

BEST AVAILABLE COPY

Art Unit: 1754

equivalents for this language, it fails to particularly point out and distinctly claim the invention as required under 35 U.S.C. 112-2nd paragraph: see, *In re Dossel*, vide supra.

Claims 45-49, 51-82, 96, 203 and 232 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no descriptive support for the term "macroscopic". One of ordinary skill reading the specification as originally filed would not have reasonably expected claims to the large-scale "macroscopic" amounts which are now being claimed.

Claims 45-49, 51-82, 96, 203 and 232 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the preparation of a two-micron thick C₆₀ coating, does not reasonably provide enablement for all macroscopic amounts of C₆₀. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

Note that the specification is not a commensurately enabling one, since the scope of the claims is broadened from the original disclosure, in that they now embrace formation and isolation of very large tonnage quantities of C₆₀, while the original disclosure's literal language only supports production of C₆₀ quantities sufficient to produce 2-micron thick coatings.

There is no disclosure supporting or describing larger quantities of C₆₀ as are now embraced by the claims.

BEST AVAILABLE COPY

Art Unit: 1754

Claims 45-49, 51-84, 96, 181 and 203-248 of this application conflict with claims 57-63 and 68-87 of Application No. 08/486,669. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP 822.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 45-49, 51-84, 96, 181, 203-248 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 57-63 and 68-87 of copending Application No. 08/486,669. Although the conflicting claims are not identical, they are not patentably distinct from each other because the respective claims only differ in the functional recitation of how much C₆₀ fullerene is made in the carbon vaporization process. However, it would have been obvious to one having ordinary skill in the art at the time the

BEST AVAILABLE COPY

Art Unit: 1754

invention was made to have carried out the process of the instant claims, in view of the copending '669 application, because the claims of said copending application is directed to the same production and recovery of the same C₆₀ as are the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 45-49, 51-84, 96, 181 and 203-248 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kratschmer article in view of Hamilton '428 and Kargin.

The Kratschmer article substantially identically recites the C₆₀-fullerene production steps of the instant application. More particularly, this reference teaches producing carbon smoke

BEST AVAILABLE COPY

Art Unit: 1754

particles by resistive heating of graphite rods in an inert He quenching gas having a pressure of 100 torr. The smoke was collected on substrates. Infrared and ultraviolet spectroscopy of the collected substance was consistent with a C₆₀ molecule of the soccerball structure. See entire document.

This article qualifies as prior art by virtue of section 102(a) of 35 U.S.C., since it is technically a reference to "another", due to the presence of the Fostiropoulos co-author. Please see MPEP 2132.01, especially discussion therein to Ex parte Kroger, 219 USPQ 370 (BPAI 1982).

This article does not appear to have "extracted" C₆₀ from the smoke particles.

Hamilton '428 teaches that it is known to disperse carbon black in benzene in order to form ink compositions or rubber compositions. See column 1, lines 50-65.

Kargin teaches that carbon particles made from the condensation of carbon vapor in an argon atmosphere, can be deemed to be carbon black. A graphite anode and cathode were opposed to each other and a plasma was formed therebetween by passing current to the electrodes. A solid product was collected on a quartz tube. See page 258, lines 18-22 and page 256, lines 10-36.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have dispersed the carbon smoke particles of the Kratschmer reference in benzene, thereby to have accomplished an extraction of C therefrom, because Hamilton teaches that it is known to disperse carbon black in benzene in order to form ink compositions or rubber

BEST AVAILABLE COPY

Art Unit: 1754

compositions, and because Kargin would teach to the person of ordinary skill in the art to recognize Kratschmer's particles as being carbon black.

Please note that even those claims drawn to the recovery of "crystalline C₆₀ do not specify purity and embrace C₆₀ in admixture with C70 and even graphite and "fullerenic soot" (the bulk of the "sooty carbon product of the instant claims") Thus these claims continue to embrace the trace quantities of C₆₀ which would naturally be brought about upon application of Hamilton's benzene to the carbon product of Kratschmer, as per the teachings of Kargin.

Applicant's arguments filed 11 January 1999 have been fully considered but they are not persuasive.

Applicants argue that the claim limitation to amounts of C₆₀ capable of being extracted in "solid" form is definite, because: an amount of a solid would be "visible", and in any event, no lower limit of amount need be recited in order for a claim to be definite in the sense of 35 U.S.C. 112, second paragraph.

However, in this particular situation, applicants' arguments are not commensurate in scope with the claims. None of the claims state a step of isolating a visible amount of solid C₆₀.

At best, the claims extract C₆₀ in amounts "sufficient to isolate said C₆₀ as a discernible solid", without actually doing that isolation. Thus the claims can be construed to embrace isolation of a massive quantity of soot that has in toto, a microgram of solid C₆₀ dispersed therein. If applicants argue that it is not their intent that the claims should be so construed, then the claims do not particularly and distinctly point out what applicants regard as their invention.

BEST AVAILABLE COPY

Art Unit: 1754

Claim 181 is a special case. In that claim, C₆₀ has to be extracted in solid form, from soot.

For this claim, the question is "begged" as to how much or little needs to be present as a "solid".

Certainly, a mass quantity of soot with a negligible amount of C₆₀ would not be a liquid or gas or plasma, but a solid. Is this applicants' intent?

Applicants argue that the Dossel decision has not been applied properly, because the "Donaldson" decision quoted within Dossel, allegedly places responsibility within PTO to look for "equivalents".

However, it appears that the quoted citation of "Donaldson" which is within "Dossel", was only relied upon to support the position that the specification for invention must itself set forth the equivalents, in order for claims to be definite.

Applicants argue that the term "macroscopic" is supported in the specification, at least conceptually. This is because color was seen from solutions of C₆₀, and color was seen as a coating of C₆₀, and an X-ray diffraction was obtained.

However, the new "macroscopic" language greatly broadens the original specification to embrace formation and isolation of tonnage quantities of C₆₀. Nothing in the specification hints that such is possible.

Applicants argue that the PTO is using "an engineering issue involving 'scaling up' to support its allegation of lack of enablement".

However, the rejection is not for complete lack of enablement, but for commensurate lack of enablement. It is readily accepted that the 2-micron thick coating was made. It is not readily

BEST AVAILABLE COPY

Art Unit: 1754

accepted that the specification describes in any way how to make any arbitrarily large "macroscopic" amount. How would one go about doing this?

Applicants argue that the book by Baggott cannot possibly be given weight vis-a-vis the Kratschmer declaration, since the latter was sworn testimony and the former is not.

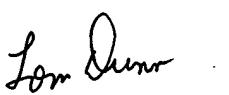
However, although there is no dispute that Kratschmer has made a proper declaration per se, the statements declared therein are not convincing, in view of the "Katz" decision itself. It is the position of the office that the "Katz" decision is distinguished in this case, because of not one, but two pieces of evidence: the article itself naming Fostopoulos as co-author, and the Baggott description of Fostopoulos' contribution. In the case of "Katz" there was nothing other than co-authorship which could impute co-inventorship. There is more here.

Any inquiry concerning this communication should be directed to Peter DiMauro at telephone number (703) 308-0680.



P. DiMauro:jp

April 5, 1999


THOMAS DUNN
PATENT EXAMINER

BEST AVAILABLE COPY